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Social Bonding, Social Learning, and Delinquency: A n Examination of Two Etiological Theories of Deviance

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SOCIAL BONDING, SOCIAL LEARNING AND DELINQUENCY: AN EXAMINATION OF TWO ETIOLOGICAL THEORIES OF DEVIANCE

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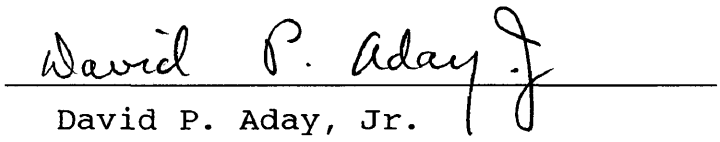

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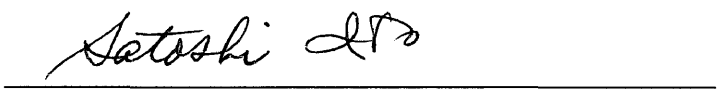

Satoshi Ito

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Abstract

According to Social Bonding Theory, "affective bonds" to significant others constrain individuals and make deviant behavior unlikely. Therefore, delinquency is likely when there is an absence of social bonds. According to Social Learning Theory, significant others may contribute to or constrain deviant behavior depending on their conventionality.

The current study uses data from the first wave of the National Youth Survey (NYS) to examine alternative hypotheses derived from each theoretical perspective. Using factor, correlation, regression, and cross-tabular analyses, the study attempts to answer several questions: First, which of the two theoretical models is the more powerful explanation of deviance? Second, do Social Learning variables mediate the effects of Social Bonding variables on delinquency or vice versa? Third, what are the conditional relationships between attachment to peers, peer delinquency, and a youth's own delinquency.

Findings from this study lend some support to each theoretical perspective. However, findings generally support Social Learning Theory over Social Bonding Theory. Results suggest several things: First, Social Learning Theory is a more powerful explanation of delinquency. Second, Social Learning Theory variables mediate the effects of Social Bonding variables on measures of delinquency. Third, association with delinquent peers increases the likelihood of delinquency at all levels of peer attachment.

SOCIAL BONDING, SOCIAL LEARNING, AND DELINQUENCY: AN EXAMINATION OF TWO ETIOLOGICAL THEORIES OF DEVIANCE

INTRODUCTION AND THEORETICAL BACKGROUND

Two theoretical perspectives that address the etiology of criminal behavior are Social Control Theory and Social Learning Theory. Several versions of each perspective exist, and empirical support has been accumulating for each version. In the current study, a prominent control theory and a prominent learning theory are reviewed and empirically tested. These theories are **Social Bonding Theory** (Hirschi, 1969) and **Social Learning Theory** (Burgess and Akers 1966; Akers, 1973).

Social Bonding Theory and Social Learning Theory have often been described as competing etiological explanations. The primary difference in the theories centers on the role of significant others in the development of deviance.

According to Hirschi (1969), "affective bonds" to significant others (for example, parents, peers, and teachers) constrain individuals and make deviant behavior unlikely. Moreover, Hirschi maintains that delinquent adolescents are incapable of developing strong affective bonds to parents and peers. Rather, relationships between delinquent adolescents, their peers, and their parents are portrayed as "cold and brittle" (Hirschi 1969, p. 141). Thus, regardless of the disposition to deviance of significant others, the presence of warm, affective interpersonal relationships between

individuals and their peers and parents makes delinquency less likely.

Alternatively, according to Social Learning Theory, parents and peers may act as either constraining or contributing influences in the development of delinquency. From this perspective, relationships between individuals and their significant others are important in that they provide the means through which individuals learn behaviors, ideas, attitudes, and rationalizations that are either favorable, unfavorable, or neutral towards delinquency. Therefore, "bonds" or attachments to friends and family are important because they increase the likelihood of interaction, which, in turn, may increase or decrease the likelihood of delinquency.

In the current study, I examine relationships between delinquency and variables from Social Bonding Theory and Social Learning Theory. I use factor, correlational, cross-tabular, and multiple regression analyses to examine the data. First, principal components analysis is used to examine the underlying empirical relationships among items measuring the theoretical concepts. Next, I use correlational analyses to examine relationships between measures of social bonds, measures of concepts from Social Learning Theory, and measures of delinquency. Then, I use regression analyses to examine the predictive power of each theoretical model and to compare the relative power of the two models. At the same time, I will examine the nature of the relationships among the independent and dependent variables. Finally, using cross

tabulations, I examine the conditional relationships among the variables in both theories.

Description of Social Bonding Theory

Travis Hirschi's version of Control Theory, often referred to as Social Bonding Theory, asserts the significance of four main concepts: attachment, commitment, involvement and belief. Attachment refers to a "sensitivity to the opinion of others" (Hirschi, 1969, p.16). Commitment refers to "stakes in conformity that are built up by pursuit of, and by a desire to achieve, conventional goals" (Hirschi, 1969, p.162). Involvement refers to the idea "that a person may simply be too busy doing conventional things to find time to engage in deviant behavior" (Hirschi, 1969, p.22). Belief refers to "the extent to which people believe they should obey the rules of society" (Hirschi, 1969, p.26). These four elements represent ways that individuals become attached or "bonded" to conventional society. Hirschi argues that an individual who is highly bonded to the conventional order is not likely to deviate because of the constraining effects that social bonds have on behavior.

Description of Social Learning Theory

Akers' (1973) Social Learning Theory (See also Burgess and Akers, 1966) synthesizes concepts from Sutherland's (1947) Differential Association Theory with Behavioral Reinforcement Theory (Skinner, 1953; Rotter, 1954). The first concept in Akers' Social Learning Theory is imitation. Imitation refers

to "engaging in behavior after observation of other's behavior" (Akers, 1973: 52). The second concept is differential reinforcement.

> In the simplest terms, differential reinforcement means that given two alternative acts, both of which produce and are reinforced by the same or similar consequences, the one which does so in the greatest amount, more frequently, and with higher probability will be maintained.... But, differential learning of this kind is most dramatic and effective when the alternatives are incompatible and one is rewarded while the other is unrewarded (Akers, 1973: 52-53).

Differential association is the third concept in Social Learning Theory. This concept is drawn from Sutherland's (1947) theory and it pertains to learning both techniques of crime and law violating definitions. These techniques and definitions are learned through exposure to patterns of deviance. Definitions favorable to law violations is the final concept and it pertains to normative meanings given to behavior that define the behavior as right or wrong.

REVIEW OF THE LITERATURE

Social Bonding Theory

Hirschi's (1969) initial research suggests that an inverse relationship exists between each of the four social bonding elements (attachment, commitment, involvement, belief) and delinquency.

Attachment to Parents

Consistent with Hirschi, some researchers have found a negative relationship between measures of attachment to parents and delinquency (cf. Krohn and Massey, 1980;

Wiatrowski, Griswold and Roberts, 1981; Johnson, 1984; Thompson, Mitchell and Dodder, 1984; Thornton and Voigt, 1984; Marcos, Bahr, and Johnson, 1986; Marcos and Bahr, 1988; Friedman and Rosenbaum, 1988; Williams and Hawkins, 1989). Krohn and Massey (1980) use items that reflect components of parental supervision, praise, closeness and satisfaction to measure parental attachment. They find support for a negative relationship between parental attachment and several forms of delinquency. Wiatrowski, Griswold, and Roberts (1981) use measures that closely parallel Hirschi's own in their test of Social Bonding Theory. Their findings also suggest that an inverse relationship exists between parental attachment and delinquency.

Attachment to Peers

Findings from research testing the relationship between attachment to peers and delinquency generally do not support Hirschi's (1969) reported finding. Hirschi reported an inverse relationship between attachment to peers and delinquency. However, subsequent research has generally shown that attachment to peers and delinquency are related positively. For example, Brownfield and Sorenson (1991) report a positive relationship between those who share their thoughts and feelings with their best friends (attachment to peers) and drug use. Gardner and Shoemaker (1989) report a positive relationship between attachment to peers, measured as identification with and closeness to peers, and total delinquency, drug possession, and juvenile misbehavior.

Several others report a similar relationship between peer attachment and delinquency (cf. Hindelang, 1973; Krohn and Massey, 1980). Moreover, longitudinal research also supports a positive association between attachment to peers and delinquency. For example, Massey and Krohn (1986) employ a longitudinal design and report that Time 1 attachment to friends is positively associated with smoking at Time 3.

Attachment to School

Hirschi's reported finding of a negative relationship between attachment to school and delinquency has been supported generally by subsequent research (cf. Ousey, Aday, and Norton, 1993; Aday and Anderson, 1991; Marcos and Bahr, 1988; Liska and Reed, 1985; Thornton and Voigt, 1984; Wiatrowski, Griswold and Roberts, 1981).

Ousey, Aday, and Norton (1993) use multiple regression analyses to examine the relationship between a scaled measure of school attachment and several dimensions of delinquency. Their findings suggest that school attachment is inversely related to property crime, drug crime, and violent crime.

Marcos, Bahr and Johnson (1986) use path analysis to examine the relationships between measures of social control and drug use. Their findings are mixed on the relationship between school attachment and several forms of substance use. They report an inverse relationship between school attachment and the lifetime use of cigarettes and marijuana. However, they also report that the level of school attachment is only an indirect predictor of the use of amphetamines and alcohol.

Religious Attachment

Hirschi does not directly test the relationship between religious attachment and delinquency. However, some researchers since have tested this relationship (cf. Aday and Anderson, 1991; Marcos and Bahr, 1988; Marcos, Bahr and Johnson, 1986). Aday and Anderson (1991) found that religious attachment and drug use were related negatively. Marcos, Bahr, and Johnson (1986) found a similar relationship between religious attachment and alcohol use. However, they found that religious attachment had no significant effect on cigarette use, amphetamine use and marijuana use. Brownfield and Sorenson (1991) also failed to find evidence of a significant relationship between religious attachment and deviance.

Commitment

Many researchers have replicated Hirschi's reported finding of a negative relationship between measures of commitment and various forms of delinquency (cf. Krohn and Massey, 1980; Wiatrowski, Griswold and Roberts, 1981; Thornton and Voigt, 1984; Massey and Krohn, 1986; Agnew, 1991). Wiatrowski et. al. (1981) use a broad measure of commitment that includes items ranging from occupational aspirations to frequency of dating, and they report a weak negative association. Agnew (1991) reports that the negative association he finds between commitment and deviance is the only statistically significant association between social bonding concepts and deviance.

Involvement

The negative relationship Hirschi found between involvement and deliquency also has been supported by several researchers (cf. Wiatrowski, Griswold, and Roberts, 1981; Thornton and Voigt, 1984; Johnson, 1984; Agnew, 1985; Friedman and Rosenbaum, 1988).

Johnson (1984) found a negative relationship between involvement, measured by the the time spent working in the home and time spent in recreational activities with family, and alcohol use. Friedman and Rosenbaum (1989) measure involvement as the frequency of finishing homework. They also report a negative association between involvement and delinquency.

Belief

Some researchers have found support for the predicted negative association between belief, typically measured by items reflecting agreement with legal norms or items that reflect levels of honesty, and delinquency (cf. Krohn and Massey, 1980; Wiatrowski et al., 1981; Thornton and Voigt, 1984; Marcos, Bahr and Johnson, 1986; Massey and Krohn, 1986; Matsueda, 1989).

Despite the empirical support cited, researchers generally have reported mixed findings. As noted, some researchers have found evidence contradicting the inverse relationship between peer attachment and delinquency reported by Hirschi. In addition, some have found evidence contradicting other relationships specified in the theory.

For example, several researchers have failed to find support for the relationship between attachment to parents and delinquency (cf. Agnew, 1991; Agnew, 1991; Akers and Cochran, 1985; Massey and Krohn, 1986; Matsueda and Heimer, 1987). Others have not found support for the negative relationship between attachment to school and delinquency (cf. Agnew 1985; Agnew, 1991). Still others have failed to find support for the inverse relationship between commitment and delinquency (cf. Agnew, 1985; Wiatrowski and Anderson, 1987; Williams and Hawkins, 1989). And some have found no support for a negative relationship between involvement and delinquency (cf. Williams and Hawkins, 1987; Wiatrowski and Anderson, 1987; Agnew, 1985). Finally, some have failed to find support for the predicted relationship between belief and delinquency (cf. Agnew, 1991; Akers and Cochran, 1985; Massey and Krohn, 1986; Matsueda and Heimer, 1987).

The mixed findings on Hirschi's theory can be attributed to several things. First, research testing the theory exhibits substantial measurement inconsistency (cf. Ousey, Aday, and Norton, 1993; Agnew, 1991). Second, Hirschi's own work suffers from a lack of conceptual clarity and operational consistency. For example, several researchers suggest that the conceptual distinction Hirschi makes between involvement and commitment is inappropriate because involvement in conventional activities is really a behavioral measure of commitment to conventional goals. Therefore, alternative models that amalgamate commitment and involvement have been suggested (cf. Krohn and Massey, 1980; Conger, 1976).

Social Learning Theory

There is substantial support for several versions of Learning Theory. Edwin Sutherland's Differential Association Theory (1947) is probably the most prominent learning theory and it is generally supported by empirical research (cf. Jensen, 1972; Krohn, 1974; Burkett and Jensen, 1975; Poole and Regoli, 1979; Matsueda, 1982; Matsueda and Heimer, 1987; Orcutt, 1987; Sellers and Winfree, 1990, Aday and Anderson, 1991). Research consistent with Differential Association Theory also supports Akers' Social Learning Theory because of the similarities between the theories. In addition, some researchers have directly tested Akers' Social Learning Theory or similar models, and findings generally are supportive (cf. Conger, 1976; Akers, Krohn, Lanza-Kaduce and Radosevich, 1979; Akers and Cochran, 1985; Dembo et al., 1986; Spear and Akers, 1988; Akers, LaGreca, Cochran, and Sellers, 1989; Sellers and Winfree, 1990). Research suggests that Akers' Social Learning Theory is a flexible and powerful explanation of various deviant and non-deviant behaviors in several age cohorts.

Social Learning Theory and Substance Use

Previous research generally shows that Social Learning Theory variables are good predictors of substance use. Krohn (1974) provides direct support for Differential Association Theory when he reports that 79 percent of the respondents who report using drugs are introduced to drugs by good friends or close relatives. Jensen (1972) reports similar results in his study of Differential Association Theory. He finds that

association with delinquent friends and definitions favorable to law violation are related directly to delinquent involvement.

Sellers and Winfree (1990) test the effect of Social Learning Theory variables on the frequency of alcohol use among both middle school and high school students. Their findings are consistent with Social Learning Theory for both age groups. In each group, peer associations and personal definitions are significant predictors of the frequency of alcohol use. These effects are generally stronger in the high school population.

Similarly, Winfree and Griffiths (1983) test the ability of Social Learning Theory to explain marijuana use in several cohorts (1975 to 1979) of adolescents in a rural middle school. They report that Social Learning Theory variables account for 34% of variance in the level of marijuana use by the 1975 cohort and 52% of the variance in marijuana use by the 1979 cohort.

Akers, Krohn, Lanza-Kaduce, and Radosevich (1979) test the ability of Social Learning Theory to account for variance in measures of marijuana and alcohol use and abuse. Their findings suggest that variables from the theory are moderate to strong predictors of both substance use and substance abuse. Specifically, Social Learning Theory variables account for 68% of the variance in marijuana use (39% of abuse) and 55% of the variance in alcohol use (32% of abuse).

Social Learning Theory research also shows that variables from the theory can predict the use of alcohol among older

populations as well as among adolescent populations. For example, Akers, La Greca, Cochran, and Sellers (1989) report that Social Learning Theory is able to explain variance in the use of alcohol among elderly individuals.

Social Learning Theory and Aggression

Some previous research also tests the relationship between Social Learning Theory variables and aggressive behavior. Findings from this research are partially supportive of Social Learning Theory. Neopolitan (1981) reports that children with fathers who model and encourage aggressive behavior are more likely to be behave aggressively. However, children with mothers who model and encourage aggressive behavior are less likely to exhibit such behavior. This finding does not support Social Learning Theory and suggests that an unknown variable outside of the Social Learning Theory model mediates the effect of a mother's aggressive orientation on her children's subsequent behavior.

Social Learning Theory and Non-deviant Behavior

Social Learning Theory also has been used to explain cessation of, rather than engagement in, a particular behavior. For example, Lanza-Kaduce, Akers, Krohn, and Radosevich (1984) show that Social Learning Theory is able to distinguish between adolescents who ceased the use of alcohol and drugs and their counterparts who continued use.

Social Bonding Theory vs. Social Learning Theory

As the preceding review demonstrates, many researchers have tested and found support for either Social Bonding Theory or Social Learning Theory. In addition, several researchers have tested both theories simultaneously (cf. Akers and Cochran, 1985; Matsueda, 1982; Matsueda and Heimer, 1987; Gauvreau, 1991; Burkett and Warren, 1987; Agnew, 1991; Elliott, Ageton, and Canter, 1979; Massey and Krohn, 1986; Marcos, Bahr and Johnson, 1986). These researchers generally have either tested the theories as competing explanations of deviance (cf. Akers and Cochran, 1985; Matsueda and Heimer, 1987) or as single explanations that synthesize variables from both theories into a single model (cf. Marcos, Bahr, and Johnson, 1986; Massey and Krohn, 1986; Elliott, Huizinga, and Ageton, 1985).

Findings from research that tests the two theories as competing explanations of deviance are mixed. Akers and Cochran (1985) report that Social Learning Theory is a much more powerful predictor of marijuana use than Social Bonding Theory. In their research, the Social Learning Theory model explains more than twice as much variance in a measure of marijuana use than does Social Bonding Theory. Moreover, when variables from each theory are combined into a single model, the Social Learning Theory variables mediate the effects of the Social Bonding Theory variables on marijuana use. Several other researchers have found that Social Learning Theory variables mediate the effects of Social Bonding Theory variables on measures of delinquency (cf. Matsueda, 1982;

Matsueda and Heimer, 1987). However, findings from several longitudinal studies suggest the often reported relationship between association with delinquent peers and delinquency (usually interpreted as support for Social Learning Theory) is a matter of peer selection rather than peer socialization (cf. Gauvreau, 1991; Burkett and Warren, 1987). This finding supports Social Bonding Theory over Social Learning Theory.

Finally, several researchers have integrated Social Bonding Theory and Social Learning Theory by focusing on the conceptual overlap between the two theories. Findings from research testing these integrated models generally support such models (cf. Marcos, Bahr and Johnson, 1986; Massey and Krohn, 1986; Elliott, Huizinga and Ageton, 1985; Elliott, Ageton, and Canter, 1979). The current study examines the two theories as competing explanations and focuses on the role peers have in the development of deviance.

HYPOTHESES

Previous research generally supports both Social Bonding Theory and Social Learning Theory, but empirical findings present mixed evidence on the role significant others (e.g. peers) play in the development of deviant behavior. Moreover, research findings are unclear as to whether social bonding variables affect delinquency directly or whether the effects are mediated. The current research examines the following questions: Which of the two theoretical models is the more powerful explanation of delinquency? Second, do Social Learning Theory variables mediate the effects of bonding

variables on delinquency or vice versa? Third, what are the conditional relationships between attachment to peers, peer delinquency, and a youth's own delinquency. To answer these research questions, several general hypotheses will be tested. These hypotheses are posited below:

Hypotheses

Hypothesis 1A: All measures of social bonding will be related significantly and negatively to delinquency.

Hypothesis 1B: Differential association with delinquent peers, differential reinforcement of delinquent conduct and definitions favorable to law violation will be related significantly and positively to delinquency.

Hypothesis 2A: All measures of social bonding will be significant predictors of delinquency, net of all other variables.

Hypothesis 2B: Social learning variables will mediate the effects of social bonding on measures of delinquency.

Hypothesis 3A: Attachment to peers will be related significantly and negatively to measures of delinquency, regardless of the conventionality of peers.

Hypothesis 3B: Association with delinquent peers will be significantly and positively related to delinquency, regardless of the level of peer attachment.

Hypothesis 4A: Peer attachment and peer delinquency will be related significantly and negatively.

Hypothesis 4B: Peer attachment is not related significantly to peer delinquency.

STUDY DESIGN

Sample

The current study involves secondary analysis of the first-wave of the National Youth Survey (NYS) data collected by Delbert S. Elliott (1976). This survey is a longitudinal

study of delinquency and drug use consisting of five waves of data. Elliott et al. employed a multistage cluster sampling frame to obtain a national probability sample of households in the United States in 1976. Nearly 8,000 households were selected randomly, and all (2,360) eligible youths 11-17 in 1976 were included. Seventy-three percent (1,725) of these youths agreed to participate and signed consent forms. Both the selected youths and one of their parents completed a first-wave interview in 1977. According to the authors, the result is a reasonable representation of the population of 11-17 year old youths in the United States in 1976.

The current study examines only responses from those who were included in the first wave of data. The data were collected between the beginning of January and the end of March of 1977. The data in Wave 1 focus on delinquent activity during the calendar year of 1976. The reasons for selecting only one wave of data for the current study are discussed in the following section.

Temporal Order

The National Youth Survey allows a time-order examination of the effects of social bonding and social learning variables on deviant behavior. However, there is some reason to believe that the effects of social bonds are contemporaneous. Liska, et al. (1984) argue that the effects of <u>beliefs</u> on behavior are contemporaneous. Individuals, especially adolescents, are likely to base their behavior on current rather than past beliefs. Moreover, current relationships and stakes in

conformity (commitment and attachment) are more likely to affect behavior than are past relationships and stakes in conformity. Similarly, current involvements in conventional activities such as schoolwork and activities with friends are more likely to affect delinquency than are past involvements.

Empirical research suggests that the effects of contemporaneous bonds are larger. Moreover, research examining lagged effects generally suggest that such effects are not significant (cf. Burkett and Warren, 1987; Liska and Reed, 1985; Thornberry and Christenson, 1984; Meier, Burkett, and Hickman, 1984). However, this research does not mean that past levels of social control are unimportant. Rather, it is likely that experiences in the past are important to the extent that they affect current levels of social control (cf. Agnew, 1991).

A similar argument can be made about social learning variables. As previous researchers have noted, there is conceptual overlap between Bonding Theory's conventional beliefs and Learning Theory's definitions favorable to law violation (cf. Marcos, Bahr and Johnson, 1986). In fact, these concepts appear to be different sides of the same coin. Therefore, following Liska, et al. (1984) who argue compellingly that the effects of beliefs on behavior are contemporaneous, it can be argued that the effects of definitions favorable to law violations on deviant behavior also are contemporaneous. Moreover, the effects of present associations with delinquent friends on delinquent behavior are likely to be contemporaneous as well.

The conceptual arguments and empirical evidence are sufficiently persuasive that I have chosen to use a cross-sectional design for the current study. However, it should be noted that the data in the National Youth Survey do not lend themselves easily to an examination of contemporaneous effects (see Agnew, 1991).

At first glance, social bonding and social learning variables appear to measure reported experiences at the time of the interview, while delinquency measures refer to behavior committed during the previous twelve months. Use of a cross-sectional design, then, leads to the appearance that present experiences are used to explain past behaviors (cf. Agnew, 1991). Agnew (1991: 141) argues that the cross-sectional strategy is viable because many of the social control measures "implicitly refer to past behavior". This also can be said for the social learning measures, which implicitly refer to past attitudes and past behaviors of peers and parents.

Moreover, some researchers suggest that this design is efficacious because it involves little chance of exaggerating the contemporaneous effects of the independent variables (See Kercher, 1988, p. 296). Thus, while the data do not provide the ideal test of contemporaneous effects, the cross-sectional design seems viable.

MEASUREMENT OF VARAIBLES

Social Bonding Theory

I selected twenty-one items that appear to be related to the social bond elements of attachment, commitment,

involvement and belief. Five items reflect parental or family attachment, four items each reflect peer attachment, school attachment, and commitment, and three items each reflect involvement and belief (See Appendix A for variable descriptions).

To determine measures of the Social Bonding Theory variables, I examine both the conceptual and the empirical relationships among the selected items. First, the underlying empirical structure of these variables is explored using prinicipal components analysis (PCA). Using the varimax method of orthogonal rotation, principal components analysis converges in a seven factor solution that accounts for 53.7% of the variance in the total data-set. Results from these analyses are presented in Table 1.

The first factor contains four items that reflect attachment to parents and family. These items include measures of communication with parents, ability to get along with parents, time spent with family, and level of parental influence. The second factor consists of five items. Four of these items reflect attachment to school. These four items measure the degree to which the respondent feels alienated at school. The fifth item measures whether the respondent thinks it is alright to lie to parents in order to keep their trust. This item clearly does not reflect school attachment. The third factor consists of three items. Two of the items reflect conventional beliefs. They describe the respondent's beliefs about cheating and honesty. The third item, "Feel close to friends," does not seem to reflect conventional

beliefs. The fourth factor consists of three items that reflect commitment to conventional goals. These items measure the importance of a high grade point average, the importance of going to college, and the importance of having a good career. The fifth factor consists of two items that represent involvement in conventional activities. These two items measure time spent studying outside of school. The sixth factor contains two items that reflect attachment to peers. These items measure the importance of friends and respondents sense of the level of influence friends have on them. The seventh factor includes two items that reflect peer involvement. One item measures whether the respondent hangs around with a particular group of friends. The other asks how often the respondent dates and socializes during the week.

The conceptual interpretations of Factors 2 and 3 are not entirely clear. To improve the homogeneity and interpretability of the items loading on these two factors, I eliminated the two items that seem unrelated to others on the factors and did a second principal components analysis. This analysis did not significantly improve the interpretability of the factors. Rather, the results suggested that several additional items should be eliminated. Therefore, an additional three items were eliminated and I did a third principal components analysis of the remaining items.

Refined Social Bonding Factors and Measures

After eliminating a total of five items, principal components analysis and varimax rotation converged in a stable and interpretable six factor solution that accounts for 54.7% of the variance in the reduced data set. Results are presented in Table 2.

Factor 1: Parental Attachment. The first factor, parental attachment, contains the four items reflecting parental attachment described in the initial factor structure. Factor 2: Commitment to Conventional Goals. The second factor, commitment to conventional goals, also consists of four items. Two of these items measure the importance of conventional goals and aspirations for success. They reflect commitment. The other two items measure the amount of time spent studying during the school week. These items reflect involvement in conventional activities. While Hirschi presented commitment and involvement as distinct dimensions, several researchers argue compellingly that commitment and involvement reflect the same dimension of Social Bonding Theory (cf. Conger, 1976; Krohn and Massey, 1980). Based on the argument presented by these researchers, I have chosen to accept the four items as a measure of the variable commitment. Factor 3: School Attachment. The third factor, school attachment, contains two items. These items measure the degree of alienation the respondent feels when at school. Factor 4: Peer Attachment. The fourth factor, peer attachment, contains two items. The first item measures how important friends are to the respondent. The second item

measures the level of influence that friends have. Factor 5: Beliefs. The fifth factor, beliefs, contains two items that reflect conventional beliefs. The first item measures the belief that success can be obtained without cheating. The second item measures the importance of being honest with parents. Factor 6: Peer Involvement. The sixth factor, peer involvement, contains two items. The first item asks about respondents' peer associations. The second item measures the frequency that respondents date and socialize during the week.

Social Learning Theory

The survey includes twenty-four items reflecting differential reinforcement, definitions of drug or alcohol use, and differential peer associations that have been selected for the current study. No direct measure of imitation is available in the data. However, this should not significantly reduce the tests of the social learning model because previous research suggests that measures of imitation account for little, if any, of the explained variance in measures of delinquency (Akers et al., 1979; Akers and Cochran, 1985).

Twelve of the items reflect aspects of differential reinforcement. Six of these measure perceived reactions of friends to respondents' involvement in delinquency. The other six reflect perceived reaction of parents to the respondents' involvement in delinquency.

Definitions favorable to law violation is measured by five items that reflect the respondents' approval or

disapproval of various forms of delinquency. Differential peer associations is represented by seven items that ask respondents how many of their friends have engaged in particular delinquent behaviors or have encouraged them to break the law.

To examine measures of the Social Learning Theory concepts, I use the same factor analytical procedures as before. First, the underlying empirical relationships among the twenty-four items are examined using principal components analysis and varimax rotation. This analysis extracted five factors that satisfy minimum eigen value criteria (See Table 3). This five factor solution accounts for 61.8% of the variance in the data set.

The first factor contains eight items that reflect a variety of social learning concepts. Several items reflect the respondents' definitions of alcohol and marijuana use. However, other items measure the perceived reaction of peers and parents to respondents' use of marijuana and alcohol. This factor is not easily or clearly interpretable. It may reflect general attitudes towards marijuana and alcohol use. The second factor contains four items that reflect parental reactions to involvement in theft, marijuana use, and the sale of hard drugs. These items reflect parental reinforcements. The third factor contains four items that reflect peer reactions to the respondents' involvement in theft, marijuana use, and the sale of hard drugs. These items reflect peer reinforcements. The fourth factor contains four items that reflect the number of the respondents' friends who have

engaged in law violation or have suggested that respondents break the law. These items clearly reflect differential associations. Finally, the fifth factor is hard to interpret. It contains four items that reflect respondents', parents', and peers' definitions of whether it is wrong to hit someone. It appears to represent **general crime definitions**, but the interpretation is not entirely clear.

Three of the above factors represent clearly interpretable dimensions of Social Learning Theory. The conceptual interpretation of the other two factors is less clear. To improve the interpretability of all the Social Learning factors, I used the same process of elimination that was used for the factors describing Social Bonding Theory. After eliminating the ambiguous items on Factors one and four, principal components analysis was again performed. This process continued until an interpretable solution was reached.

Refined Social Learning Factors and Measures

After eliminating seven items, principal components analysis and varimax rotation extracted a stable and interpretable five factor solution (See Table 4). This five-factor solution accounts for 66 percent of the variance in the reduced data set. Factor 1: Parental Reinforcements. The first Social Learning Theory factor, parental reinforcements, contains a cluster of four items that represent perceived parental reactions to respondents' involvement in various delinquent behaviors. Factor 2: Peer Reinforcements. The second factor, peer reinforcements, consists of four items

that measure perceived peer reactions to the respondents' participation in a range of delinquent activities. Factor 3: Drug Definitions. The third factor, drug definitions, contains three items. These items measure respondents' approval or disapproval of involvement in the use of marijuana, the use of alcohol, and the sale of hard drugs. Factor 4: Differential Associations. The fourth factor, differential associations, contains four items. These four items measure how many of the respondents' friends have engaged in a range of deviant behaviors or have suggested that respondents break the law. Factor 5: General Crime Definitions. The fifth factor, general crime definitions, contains two items. These items measure respondents' levels of approval for involvement in theft or assault.

Delinquency Factors and Measures

Previous research suggests that the explanatory power of etiological theories of crime vary by the type and seriousness of the criminal activity. Therefore, several items that reflect separate dimensions of delinquent activity are selected. These items include measures of assault, theft, the sale of hard drugs, marijuana use, and alcohol use. Each item asks how frequently respondents have engaged in the behavior within the previous year, with responses ranging from zero times to 2-3 times daily.

The underlying empirical structure of these items was examined through principal components analysis. Using the varimax method of orthogonal rotation, this analysis converges

in a two factor solution (See Table 5) that accounts for 68.2% of the variance in the data-set. Factor 1: General Crime. The first delinquency factor, general crime, contains six items that measure crimes such as theft, the sale of hard drugs, and assault. Factor 2: Substance Use. The second delinquency factor, substance use, contains two items that measure the use of alcohol and marijuana.

Index Construction

Index measures of the items loading on each of the Social Bonding, Social Learning, and Delinquency factors described above are constructed to represent the theoretical concepts in the subsequent analyses. To accomplish this, the factor score coefficients matrix computed by SPSS is utilized. A composite scale score (f) for each latent variable (or factor) is computed by employing the following formula:

$$f=Fz$$

where (**F**) is the factor-score coefficient matrix and (**z**) is the vector of standardized values of the variables that have been factor analyzed (See Nie, Hull, Jenkins, Steinbrenner and Bent, 1975, p. 488)[1]. This method produces standardized indices that accurately reflect the theoretical concepts measured by the respective factors. In fact, the correlation between the composite factor-score variable and the respective factor will be 1 when principal-components analysis is used and when missing data are included or are deleted listwise.

RESULTS

Correlational Analysis

Correlations for all variables in the analysis are presented in Table 6. An examination of the correlations between Social Bonding variables and the measure of general crime reveals that all variables except peer attachment are significantly related to the general crime measure. The strength of these bivariate relationships ranges from .067 (between peer involvement and general crime) to .316 (between beliefs and general crime). The directions of relationships are consistent with Bonding Theory for parental attachment, school attachment, and commitment, all of which are inversely related to the general crime index. However, conventional beliefs and peer involvement are related positively to the general crime index. The direction of these correlations is opposite of that predicted by Bonding Theory. Moreover, the absence of a statistically significant relationship between peer attachment and general crime is not consistent with Social Bonding Theory. Thus, Hypothesis 1A is not supported.

An examination of the zero-order correlations between Social Bonding variables and the measure of substance use reveals that relationships between substance use and parental attachment, commitment, and peer involvement are statistically significant. Consistent with Social Bonding Theory, parental attachment and commitment are related negatively to substance use. Contrary to Social Bonding Theory, peer involvement is related positively to substance use. Moreover, school attachment, beliefs, and peer attachment are not significantly

correlated with substance use. Again, Hypothesis 1A is not fully supported. Only some of the Social Bonding variables are related negatively and significantly to substance use.

Zero-order correlations between general crime and Social Learning Theory variables are all statistically significant and in the expected direction. Parental reinforcements, peer reinforcements, differential peer associations, and definitions of law violation are related positively to general crime. The correlations range from .099 (between parental reinforcents and general crime) to .433 (between differential peer associations and general crime). These findings support Hypothesis 1B. All Social Learning Theory variables are related positively and significantly to delinquency.

All Social Learning Theory variables also are significantly correlated with substance use. As predicted by Social Learning Theory, parental reinforcements, peer reinforcements, differential peer associations, and definitions of law violation are positively related to substance use. The correlations range from .073 (between parental reinforcements and substance use) to .659 (between drug definitions and substance use). This suggests that delinquency is more likely when individuals have high numbers of delinquent peers, when pro-delinquent attitudes and behaviors are positively reinforced, and when individuals maintain high numbers of definitions favorable to delinquency. Thus, these results also support Hypothesis 1B.

Results from the correlational analysis suggest several things. First, different dimensions of the social bond appear

to constrain delinquent behavior depending on the type of delinquent behavior in question. For example, the relationships between general crime and attachment to school and conventional beliefs are significant while the relationships between substance use and the same bonding measures are not significant. Second, the effect that Social Learning Theory concepts have on deviance also appears to differ by the type of behavior. For instance, the general crime measure is most strongly correlated with differential peer associations and peer reinforcements, in that order, whereas substance use is most strongly correlated with drug definitions and differential peer associations, in that order.

Regression Analyses: Social Bonding Model

Ordinary least squares regression equations are computed to estimate the predictive power of Social Bonding Theory variables. In the first equation, scores on the measure of serious crime are regressed on the Social Bonding Theory variables. Results are presented in Table 7.

The six Social Bonding variables in the analysis account for six percent of the variance in the general crime index. Commitment, parental attachment, school attachment and peer involvement are significant predictors of general crime. Peer attachment and conventional beliefs are not significant predictors of general crime. This is interesting because the bivariate correlation between conventional beliefs and the general crime index was greater than the correlation between the general crime index and any of the other Social Bonding

variables. Thus, it appears that an intervening variable is mediating the direct effect of conventional beliefs on general crime. Accordingly, conventional beliefs does not have a direct effect on general crime in this equation. These results support Hypothesis 1A, with the exception that peer involvement is related positively and conventional beliefs appear to be related indirectly to general crime.

In the second regression equation, scores on the measure of substance use are regressed on the Social Bonding variables. Results are presented in Table 8. In this equation, five of six independent variables are significant predictors of substance use. School attachment is the only independent variable that is not a statistically significant predictor. In total, the independent variables in this equation account for nearly twenty-four percent (R^2=.236) of the variance in substance use. However, three variables (parental attachment, peer involvement, and commitment), account for nearly all of the explained variance (R^2=.227). Moreover, while beliefs and peer attachment are statistically significant predictors of substance use, their beta coefficients are very low. These results fail to support Hypothesis 1A in two ways. First, peer involvement is related positively to substance use. Second, there is no statistically significant inverse relationship between school attachment and substance use.

The findings are consistent with the correlational analysis in that they suggest that the effect of Social Bonding differs by type of delinquent offense. For example,

the results suggest that peer involvement is the best predictor of substance use, but a relatively poor predictor of the general crime index.

Regression Analyses: Social Learning Theory

In the first Social Learning Theory regression equation, the measure of general crime is regressed on the five measures of Social Learning Theory. Results are presented in Table 9. The five independent variables account for nearly twenty percent (R^2=.199) of the variance in general crime. However, differential peer associations is the only significant predictor of general crime, and this variable accounts for nearly all of the explained variance (R^2=.192). This finding and zero-order correlations suggest that peer associations mediate the effects of the other social learning variables on the measure of general crime.

In the second Social Learning Theory regression equation, the measure of substance use is regressed on the five Social Learning Theory independent variables. Results are presented in Table 10. In this equation, all five variables are significant predictors and they account for fifty-two percent of the variance (R^2=.522) in substance use. The measure of drug definitions is the single best predictor (BETA=.597) and it accounts for forty-six percent of the variance in substance use. The next best predictor is differential peer associations (BETA=.202). This variable accounts for an additional four percent of the variance in substance use. Peer reinforcements, parental reinforcements, and general

crime definitions are weak predictors of substance use with beta coefficients of around .10. These three variables add less than two percent to the explained variance.

Results from these two regression equations are only partially supportive of Hypothesis 1B. In the first Social Learning Theory regression equation, as predicted by learning theory, the direction of the relationship between the independent variables and general crime is positive. However, only one relationship is statistically significant. Thus, the contention that all social learning variables will be related significantly and positively to both measures of delinquency is not supported. In the second equation, there is a statistically significant inverse relationship between substance use and general crime definitions and parental reinforcements. This suggests that the higher the number of general pro-crime definitions held by respondents and the greater the perceived parental reinforcement for engaging in delinquent activity, the less likely respondents will use alcohol or marijuana. This finding is counter-intuitive and does not support Hypothesis 1B. However, the magnitude of the observed relationships is weak and therefore, the meaning is questionable.

Regression Analyses - Combined Models

In the final regression equations (Tables 11 and 12), I test Hypotheses 2A and 2B. Hypotheses 2A and 2B focus on differences between the two general theories. If Hypothesis 2A is supported, the Bonding Theory is advanced: fragile peer

relationships contribute to delinquency. If Hypothesis 2B is supported, the delinquent or non-delinquent character of peer relationships mediate the effects of peer attachments on delinquency, and Social Learning Theory is supported.

In the first equation, the measure of general crime is regressed on the eleven predictor variables from the two theoretical perspectives. Results are presented in Table 11. In this equation, the eleven variables account for nineteen percent of the variance (R^2=.194) in the general crime index. However, only six of the variables are significant predictors. Of these, differential peer associations is the best predictor (BETA=.29), followed by general crime definitions (BETA=.11). The effects of the other variables on general crime are minimal (Beta coefficients of less than .10). The beta coefficients of the relationships between the social bonding variables and the general crime measure are substantially lower in this equation than in the equation for social bonding variables alone. These results support Hypothesis 2B over Hypothesis 2A. The effects of the Social Bonding variables on the general crime measure are substantially attenuated by the inclusion of Social Learning Theory variables.

The final analysis regresses substance use on the eleven independent variables. Results are presented in Table 12. In this equation, the variables account for fifty-five percent of the variance in substance use. Eight of the variables are statistically significant predictors of substance use. However, only five variables have beta coefficients of .10 or

greater. The best predictor variable is drug definitions (BETA=.54), followed by differential peer associations (BETA=.16), peer reinforcements (BETA=.12), peer involvement (BETA=.11), and general crime definitions (BETA=-.10). Again, the beta coefficients of the social bonding variables are weaker in the combined model than in the social bonding model.

These results also support Hypothesis 2B over Hypothesis 2A. Social Bonding Theory variables are mediated (weakened) by the inclusion of Social Learning Theory variables in the regression equation.

An examination of the variance explained by each theory suggests that the Social Learning model is the more powerful model. The combined model explains roughly 13 percent more variance in general crime than the social bonding model (19 percent to 6 percent). The Social Learning model accounts for essentially the same proportion of variance in general crime as does the combined model.

The combined model explains roughly 22 percent more variance in the measure of substance use than the social bonding model (55 percent to 23 percent). However, the difference in explained variance between the combined model and the Social Learning model is very small (55 percent to 52 percent). Thus, with significantly fewer variables, the Social Learning model is able to explain nearly the same amount of variance in both types of delinquency as the combined model.

CONDITIONAL RELATIONSHIPS

One final set of analyses is designed to test Hypotheses 3A and 3B. These hypotheses specify the relationships among peer attachment, peer delinquency and delinquency. Simplified measures of each theoretical concept, using single item indicators for each measure, were used in contingency table analyses.

Peer attachment is measured by the item "friend influence," which describes the respondent's estimate of the level of influence that friends have on his or her behavior. This item had the highest loading on the peer attachment factor, and it has greater variance than any of the other items measuring peer attachment. The responses on this item are dichotomized into "low" and "high" categories. Respondents who reported that their friends had "very little" to "some" influence were included in the "low" peer attachment category. Those who reported that their friends had "quite a bit" to "a great deal" of influence were included in the "high" peer attachment category.

To measure peer delinquency, I use an item which measures the number of the respondent's friends who have used alcohol. This item was chosen because it haa greater variance than any of the items comprising the peer delinquency index (differential association index). The responses on this item are trichotomized into "none," "a few," and "most" categories. Respondents who report that none of their friends use alcohol comprise the "none" category. Respondents who report that a few or some of their friends use alcohol comprise the "a few"

category. Respondents who report that most or all of their friends use alcohol are included in the "most" category.

Finally, delinquency is measured by the number of respondents who have engaged in the use of alcohol. This item is dummied into "never" and "ever" categories. I have chosen a minor delinquent offense (alcohol use) for the measure of peer delinquency for several reasons. First, these items exhibit enough variance for meaningful cross-tabulations to be computed. Second, Social Bonding Theory and Social Learning Theory consistently have been shown to provide better predictions for minor than for serious delinquency. Therefore, whatever relationship exists between respondents' delinquency, peer delinquency and peer attachment should be more visible by using a minor offense.

Table 13 presents a two by two cross tabulation of the relationship between peer attachment and the respondent's use of alcohol. In this analysis, those who are highly attached to peers are slightly less likely to use alcohol than are those with low peer attachments. However, this difference is not statistically significant at the .05 level. This finding is not consistent with Social Bonding Theory and Hypothesis 3A is not supported.

Tables 14-16 examine the relationship between peer attachment and the respondent's use of alcohol while controlling for the number of delinquent peers. In Table 14, the relationship between the use of alcohol and the level of peer attachment is examined for those respondents who report having no friends who use alcohol. Table 14 reveals a

significant negative relationship between peer attachment and alcohol use for those with no friends who use alcohol.

Table 15 shows that among those with a few friends who use alcohol, there is no significant relationship between the use of alcohol and peer attachment. In other words, there is no statistically significant difference in the proportion of alcohol users between those who report low peer attachment and those who report high peer attachment.

Among those who report that most of their friends use alcohol (Table 16), the proportion of those with low peer attachment who use alcohol is not significantly different from the proportion who report high peer attachment and use alcohol. The results presented in Tables 14, 15, and 16 suggest that the presence of delinquent friends mediates the effect of peer attachment on the use of alcohol. Thus, Hypothesis 3B is supported over Hypothesis 3A.

In the next two contingency tables (Tables 17 and 18), I examime the relationship between peers' use of alcohol and the respondents' use of alcohol while controlling for the level of peer attachment.

Among those with low peer attachment (Table 17), alcohol use (delinquency) varies directly with the proportion of alcohol using friends (peer delinquency). In fact, those who report that most of their friends use alcohol are more than eight times more likely to report use than nonuse.

The relationship holds for those with high peer attachment (Table 18). The proportion who use alcohol (delinquency) varies significantly and directly with the

proportion of alcohol using friends (peer delinquency). Moreover, the relationship between peer delinquency and respondents' delinquency appears to be strengthened by a high attachment to peers. Those who are highly attached to their peers and report that most of their friends use alcohol are more than fourteen times more likely to use than to not use alcohol.

These results support Hypothesis 3B over Hypothesis 3A. The respondent's use of alcohol varies directly and significantly with the number of delinquent friends, regardless of the level of peer attachment.

Quality of Peer Relationships

In an introductory section of this paper, I noted that Hirschi portrays the relationship between delinquents and their peers as "cold and brittle". However, recent research suggests that the quality of peer relationships does not differ by the level of delinquency (cf. Giordano, Cernkovich, and Pugh, 1986). The final analysis in this paper tests Hypotheses 4A and 4B by examining the relationship between peer delinquency and peer attachment.

Examination of the zero-order correlation between the indexed measure of peer attachment and the indexed measure of peer delinquency reveals a negative relationship significant at the .05 level ($r=-.06$, $p<.05$). The direction of the correlation supports hypothesis 4A. Peer delinquency is related negatively to peer attachment. However, the magnitude of the relationship is weak enough to question its meaning.

To further analyze this relationship, I compute a contingency table (See Table 19) using the measures of peer delinquency and peer attachment used in previous contingency table analyses. Examination of this table reveals that the proportion of respondents who are highly attached to their peers does not vary by the delinquency of these peers. Respondents with delinquent peers are just as likely to be highly attached as are those with non-delinquent peers. Therefore, Hirschi's contention that relationships between delinquent individuals are "cold and brittle" is not supported. Hypothesis 4B is supported over Hypothesis 4A.

SUMMARY AND DISCUSSION

The purpose of this paper was to examine competing etiological explanations of crime and delinquency. Results suggest that the hypotheses derived from Social Learning Theory are supported over the hypotheses derived from Social Bonding Theory. However, Social Bonding Theory receives some support.

The direction of zero-order correlations generally supports the first two hypotheses (1A and 1B). Social Bonding Theory concepts generally were related negatively to the measures of crime. But, there were two exceptions. First, the measures of conventional beliefs were related positively with the general crime measure. This relationship is counter-intuitive and probably reflects an inadequate measure of conventional beliefs.

Second, the measure of peer involvement is related positively with both measures of delinquency. This finding is counter to Hirschi's argument but consistent with other research findings. All of the Social Learning Theory concepts are related to the measures of delinquency in the expected direction.

Results from the regression analyses also support Social Learning Theory over Social Bonding Theory. To begin with, Social Learning Theory was the better predictor of each measure of delinquency. In addition, the regression equations including measures of both theories suggest that Social Learning Theory variables are mediate and attenuate the direct effects of Social Bonding Theory variables on both measures of delinquency.

Finally, results from the contingency table analysis support Social Learning Theory over Social Bonding Theory as well. Peer attachment does not decrease the likelihood of using alcohol unless all of the respondent's peers are non-delinquent. When most of the respondent's peers are delinquent, attachment to peers does not decrease the likelihood of delinquency. All other things equal, the higher the proportion of delinquent associates, the more likely the respondent will be delinquent.

Findings from this study add to the body of literature which supports Social Learning Theory. From the results presented earlier, it appears that adolescents are heavily influenced by the behavior of their peers. Individuals appear to be socialized into delinquent or conventional activities

through interaction with peers who engage in either delinquent or conventional behavior. This socialization process apparently is enhanced by closeness or attachment among the peers, although a high degree of attachment does not appear to be necessary for socialization to take place. Moreover, the existence of an attachment to peers does not appear to constrain delinquent behavior (as Hirschi contends) unless the peers in question are conventional.

Notes

1. For example to construct a factor score scale for variables VAR001 and VAR002, the following method would be used:
FSC_1 * (VAR001 - mean of VAR001)/standard deviation of VAR001 +
FSC_2 * (VAR002 - mean of VAR002)/standard deviation of VAR002
Where FSC_n represents the factor score coefficient of the variable.

APPENDIX

APPENDIX A - VARIABLE NAMES

SOCIAL BONDING VARIABLES

HOWTGTHR - Does your family do things together?
HOWTALK - How well do you talk and communicate with your parents?
HOWWPAR - How well do you get along with your parents?
PARINFL - How much influence do your parents have on you?
TCHCALL - Teachers don't call on me
SCHCARES - Nobody at school cares about me
BLNGSCHL - I feel as if I don't belong at school
LONLYSCH - I feel lonely at school
IMPHONST - It is important to be honest with parents
NOCHEAT - I can succeed in school without cheating
LIETRUST - To keep their trust, it's o.k. to lie to parents
IMPHGPA - Importance of a high grade point average
CAREER - Importance of having a good career
GOCOLLEG - Importance of attending college
AFTSTUDY - Number of afternoons spent studying during the week
EVESTUDY - Number of evenings spent studying during the week
EVEDATE - Number of evenings spent dating during the week
GRPFREND - Do you hang around with a particular group of friends
IMPFREND - Importance of having friends
FRNDINFL - How much influence do friends have?
CLOSFRND - I feel close to my friends

SOCIAL LEARNING VARIABLES

DEFN1 - Definition of marijuana use
DEFN2 - Definition of stealing $5 or less
DEFN3 - Definition of hitting someone
DEFN4 - Definition of alcohol use
DEFN5 - Definition of the sale of hard drugs
PARREAC1 - Parents reaction to theft of $5 or less
PARREAC2 - Parents reaction to the sale of hard drugs
PARREAC3 - Parents reaction to the use of marijuana
PARREAC4 - Parents reaction to theft of $50 or more
PARREAC5 - Parents reaction to assault - hitting someone
PARREAC6 - Parents reaction to the use of alcohol
PRREAC1 - Peers reaction to theft of $5 or less
PRREAC2 - Peers reaction to the sale of hard drugs
PRREAC3 - Peers reaction to the use of marijuana
PRREAC4 - Peers reaction to theft of $50 or more
PRREAC5 - Peers reaction to assault-hitting
PRREAC6 - Peers reaction to use of alcohol
DELPER1 - Proportion of peers who use marijuana
DELPER2 - Proportion of peers who have stolen $5 or less
DELPER3 - Proportion of peers who have hit someone
DELPER4 - Proportion of peers who use alcohol
DELPER5 - Proportion of peers who sell hard drugs
DELPER6 - Proportion of peers who have stolen $50 or more
DELPER7 - Proportion of peers who suggest you break the law

DELINQUENCY VARIABLES

STOLMORE - Delinquency: Stole more than $50
SLDHDRUG - Delinquency: Sold hard drugs
HITPARNT - Delinquency: Hit parents
HITTEACH - Delinquency: Hit teacher
STOLLESS - Delinquency: Stole less than $50
HITSTDNT - Delinquency: Hit other students
USEALC - Frequency of alcohol use
USEMJ - Frequency of marijuana use

TABLE 1
Rotated Factor Matrix
Social Bonding Theory (Preliminary Factors)

	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7
HOWWPAR	.72313	-.08850	.04460	.03602	.02933	-.01856	-.02773
HOWTALK	.70890	-.05340	.07818	-.00738	.06766	-.02178	.00617
HOWTGTHR	.68154	-.00132	.02814	.01110	.15408	-.04551	.00736
PARINFL	.57472	-.03258	.08685	.24178	-.05088	.14197	.02020
LONLYSCH	-.04922	.68483	.43621	-.12051	.02940	-.07076	-.02888
SCHCARES	-.12901	.67054	-.19361	.01920	.07970	.04167	-.09042
TCHCALL	.06612	.63422	-.28656	.02994	-.06653	.02697	-.02927
BLNGSCHL	-.12013	.60484	.42825	-.29365	-.05072	-.02714	.04128
LIETRUST	-.35221	.38342	.10676	-.02195	-.13456	-.00860	.21647
NOCHEAT	.04797	.07470	.74211	-.04079	.13049	-.06101	-.08950
CLOSFRND	-.00377	-.21174	.59422	.07029	-.07932	.20411	.30814
IMPHONST	.27737	-.06120	.56618	.11207	-.02032	.01627	-.14295
CAREER	.01702	-.07867	-.05933	.72637	-.16264	.02015	.13119
GOCOLLEG	.07247	-.08345	.03726	.62126	.35338	-.00941	-.09326
IMPHGPA	.18078	.02562	.11118	.56402	.31843	.02030	-.16062
EVESTUDY	.00882	-.03383	.06022	.10885	.74762	.07999	.10471
AFTSTUDY	.16069	.01207	-.01598	.03682	.68055	-.01978	-.00841
FRNDINFL	.00121	.08470	-.03850	-.03442	.03619	.78449	.05887
IMPFREND	.02117	-.06857	.07223	.05668	.01982	.76457	-.03433
GRPFREND	.07580	.03255	-.03962	.14872	.01437	-.10881	.76610
EVEDATE	-.10347	-.08144	-.02871	-.23996	.08205	.14970	.62025

FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
1	2.898	13.8	13.8
2	2.030	9.7	23.5
3	1.560	7.4	30.9
4	1.421	6.8	37.7
5	1.228	5.9	43.5
6	1.126	5.4	48.9
7	1.010	4.8	53.7

* See Appendix A for variable descriptions.

TABLE 2
Rotated Factor Matrix
Social Bonding Theory (Cleaned Structure)

	F1	F2	F3	F4	F5	F6
HOWWPAR	.74127	.05956	-.10293	-.01787	.01124	-.05674
HOWTALK	.71733	.05198	-.02267	-.03085	.08271	.00689
HOWTGTHR	.68108	.13776	.05298	-.05875	.05831	.02588
PARINFL	.57294	.11740	-.10191	.16551	.08295	-.02261
GOCOLLEG	.09728	.69343	-.17272	.00606	-.12097	-.21446
EVESTUDY	-.01907	.64378	.02511	.08091	.13844	.25382
IMPHGPA	.17056	.63202	-.03045	.03447	.04353	-.23191
AFTSTUDY	.14404	.54755	.13278	-.03967	.07676	.14951
TCHCALL	.03344	-.04677	.78154	-.01879	-.15366	-.06151
SCHCARES	-.18735	.03917	.77041	.02632	.05018	-.03019
FRNDINFL	-.00107	.00062	.08244	.78868	-.04014	.08130
IMPFREND	.03381	.05161	-.07149	.76915	.03094	-.04046
NOCHEAT	-.01078	.08128	-.07737	-.02410	.81325	-.01047
IMPHONST	.25896	.02971	-.02088	.01882	.71547	-.10032
EVEDATE	-.10380	-.11884	-.08023	.15441	-.00160	.69351
GRPFREND	.07057	.10027	-.01531	-.10224	-.10046	.69158

FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
1	2.576	16.1	16.1
2	1.394	8.7	24.8
3	1.339	8.4	33.2
4	1.202	7.5	40.7
5	1.178	7.4	48.1
6	1.053	6.6	54.7

TABLE 3
Rotated Factor Matrix
Social Learning Theory (Preliminary Factors)

	F1	F2	F3	F4	F5
DEFN4	.86308	-.00720	.12438	-.01968	.17572
DEFN1	.79620	.09929	.22180	-.14097	-.00691
DELPER4	-.75840	.07999	-.08634	.36509	-.04541
PRREAC6	.68274	-.02462	.44150	-.05129	.16784
DELPER1	-.62449	-.02972	-.23912	.48077	.10597
PARREAC6	.56707	.42827	.01430	.08656	.15220
DEFN2	.44867	.15719	.19857	-.09455	.44765
DEFN5	.36004	.22842	.22973	-.23414	.04829
PARREAC4	-.05831	.82336	.13197	-.05992	.01982
PARREAC2	-.05696	.78096	.08215	-.07985	-.04006
PARREAC3	.29585	.74570	.10634	-.08971	-.03994
PARREAC1	.06868	.64618	.10919	-.00960	.20373
PRREAC4	.17973	.22810	.76988	-.21119	.14474
PRREAC2	.22292	.23590	.76696	-.17762	.03170
PRREAC3	.57581	.18433	.60186	-.19598	.01516
PRREAC1	.32908	.03033	.59850	-.08973	.31007
DELPER6	-.02029	-.08663	-.13904	.76133	-.01465
DELPER5	-.06455	-.13644	-.05664	.71401	.07365
DELPER2	-.30011	.00850	-.15252	.64343	-.24203
DELPER7	-.24991	.03124	-.09237	.60528	-.11406
DEFN3	.15858	.02500	.06113	.00358	.80052
PRREAC5	.09186	.02422	.53395	-.07025	.60862
DELPER3	.13157	-.00098	-.09415	.46938	-.56176
PARREAC5	.08333	.49957	.07986	.01311	.54682

FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
1	7.430	31.0	31.0
2	2.615	10.9	41.9
3	1.879	7.8	49.7
4	1.787	7.4	57.1
5	1.127	4.7	61.8

TABLE 4
Rotated Factor Matrix
Social Learning Theory (Cleaned Structure)

	F1	F2	F3	F4	F5
PARREAC4	.84034	.12700	-.01115	-.04193	.00322
PARREAC2	.81372	.05065	.00109	-.05927	-.03250
PARREAC3	.72301	.14809	.37788	-.04750	-.05246
PARREAC1	.64314	.15479	-.02843	-.02072	.35803
PRREAC4	.20928	.79878	.11756	-.21701	.12290
PRREAC2	.22434	.76540	.22801	-.16113	-.00063
PRREAC1	-.00233	.68418	.18399	-.10585	.34822
PRREAC3	.14961	.64876	.55307	-.17912	.02105
DEFN1	.04870	.25295	.86609	-.12014	.07041
DEFN4	-.07680	.20751	.79906	-.06348	.23533
DEFN5	.22614	.09447	.53793	-.26034	.17361
DELPER6	-.07533	-.16550	.04048	.79993	.01680
DELPER5	-.13746	.00619	-.10621	.76631	.08141
DELPER2	.02114	-.25136	-.19404	.62277	-.27912
DELPER7	.04820	-.15689	-.19693	.61728	-.09958
DEFN3	.01363	.07221	.10597	-.02214	.81210
DEFN2	.12413	.24378	.37285	-.12393	.64929

FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
1	5.408	31.8	31.8
2	2.130	12.5	44.3
3	1.606	9.4	53.8
4	1.071	6.3	60.1
5	1.004	5.9	66.0

TABLE 5
Rotated Factor Matrix
Delinquency Measures

	F1	F2
STOLMORE	.89338	.19116
SLDHDRUG	.86230	.14223
HITPARNT	.86057	.09736
HITTEACH	.81137	.13530
STOLLESS	.65757	.37417
HITSTDNT	.48564	.20089
USEALC	.14919	.88468
USEMJ	.20372	.85962

FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
1	4.20729	52.6	52.6
2	1.25184	15.6	68.2

TABLE 6
ZERO-ORDER CORRELATION COEFFICIENTS FOR ALL VARIABLES

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. PARATT		.147*	.216*	.263*	.014	-.059*	-.091*	-.281*	-.335*	-.203*	-.230*	-.172*	-.305*
2. SCHLATT			.135*	.053*	.003	.059*	-.181*	-.141*	-.011	-.169*	-.111*	-.132*	-.0071
3. BELIEFS				.179*	.004	-.082*	-.179*	-.239*	-.213*	-.155*	-.217*	.316*	-.027
4. COMMIT					.057*	-.046	-.050*	-.263*	-.317*	-.206*	-.169*	-.157*	-.318*
5. PEERATT						.082*	-.035	-.122*	-.048	-.072*	-.004	.002	-.040
6. PEERINV							-.036	.068*	.211*	.168*	.101*	.067*	.261*
7. PARREINF								.356*	.198*	.157*	.164*	.099*	.073*
8. PRREINF									.562*	.477*	.404*	.265*	.468*
9. DRUGDEFN										.357*	.427*	.191*	.659*
10. DIFASSOC											.253*	.433*	.433*
11. CRIMEDEFNS												.155*	.221*
12. CRIME													.377*
13. SUBSTUSE													

PARATT=PARENTAL ATTACHMENT SCHLATT=SCHOOL ATTACHMENT BELIEFS=CONVENTIONAL BELIEFS COMMIT=COMMITMENT PEER ATTACHMENT=PEER ATTACHMENT
PEERINV=PEER INVOLVEMENT PARREINF=PARENTAL REINFORCEMENTS PRREINF=PEER REINFORCEMENTS DRUGDEFNS=DRUG DEFINITIONS INDEX
DIFASSOC=DIFFERENTIAL ASSOCIATION CRIMEDEFNS=GENERAL CRIME DEFINITIONS INDEX
CRIME=GENERAL CRIME INDEX SUBSTUSE=SUBSTANCE USE INDEX
* = $p < .05$.

TABLE 7
REGRESSION OF GENERAL CRIME ON SOCIAL BONDING THEORY VARIABLES
DEPENDENT VARIABLE = GENERAL CRIME.

VARIABLE	B	BETA	T	SIG T
COMMIT	-.054	-.137	-5.059	.000
PARATT	-.047	-.119	-4.264	.000
SCHLATT	-.032	-.077	-2.953	.003
PEERINV	.044	.065	2.506	.012
PEERATT	-.011	-.027	-1.052	.293
BELIEFS	-.006	-.014	- .551	.581
(CONSTANT)	-.009		- .335	.737

R^2 = .064

TABLE 8
REGRESSION OF SUBSTANCE USE ON SOCIAL BONDING THEORY VARIABLES
DEPENDENT VARIABLE = SUBSTANCE USE

VARIABLE	B	BETA	T	SIG T
PARATT	-.231	-.222	-8.777	.000
PEERINV	.427	.243	10.254	.000
COMMIT	-.231	-.224	-9.132	.000
BELIEFS	-.077	-.073	-2.971	.003
PEERATT	-.063	-.058	-2.502	.012
SCHLATT	.032	.030	1.270	.204
(CONSTANT)	-.177		-2.613	.009

R^2 = .236

TABLE 9
REGRESSION OF GENERAL CRIME ON SOCIAL LEARNING THEORY VARIABLES
DEPENDENT VARIABLE = GENERAL CRIME.

VARIABLE	B	BETA	T	SIG T
DIFASSOC	.269	.396	14.751	.000
PRREINF	.019	.046	1.397	.162
PARREINF	.010	.019	.768	.442
CRIMEDEFNS	.022	.037	1.411	.158
DRUGDEFNS	.010	.020	.668	.504
(CONSTANT)	.211		1.827	.067

R^2 = .199

TABLE 10
REGRESSION OF SUBSTANCE USE ON SOCIAL LEARNING THEORY VARIABLES
DEPENDENT VARIABLE = SUBSTANCE USE

VARIABLE	B	BETA	T	SIG T
DRUGDEFNS	.629	.597	25.752	.000
DIFASSOC	.269	.202	9.759	.000
CRIMEDEFNS	-.124	-.107	-5.205	.000
PRREINF	.103	.125	4.912	.000
PARREINF	-.097	-.093	-4.801	.000
(CONSTANT)	1.23		7.072	.000

R^2 = .522

TABLE 11
REGRESSION OF GENERAL CRIME ON SOCIAL BONDING THEORY AND SOCIAL LEARNING THEORY VARIABLES
DEPENDENT VARIABLE = GENERAL CRIME

VARIABLE	B	BETA	T	SIG T
DIFASSOC	.156	.294	10.387	.000
CRIMEDEFNS	.051	.117	4.211	.000
COMMIT	-.029	-.073	-2.796	.005
PRREINF	.022	.069	2.030	.042
PARREINF	-.025	-.063	-2.371	.017
SCHLATT	-.021	-.052	-2.048	.040
PEERATT	.002	.005	.208	.835
PEERINV	.007	.010	.414	.679
BELIEFS	.016	.041	1.551	.121
PARATT	-.016	-.041	-1.506	.132
DRUGDEFNS	.015	.037	1.132	.257
(CONSTANT)	.018		.191	.848

R^2 = .194

TABLE 12
REGRESSION OF SUBSTANCE USE ON SOCIAL BONDING THEORY AND SOCIAL LEARNING THEORY VARIABLES
DEPENDENT VARIABLE = SUBSTANCE USE.

VARIABLE	B	BETA	T	SIG T
DRUGDEFNS	.575	.541	22.013	.000
DIFASSOC	.226	.162	7.701	.000
PEERINV	.198	.112	5.896	.000
COMMIT	-.094	-.091	-4.661	.000
CRIMEDEFNS	-.119	-.104	-4.985	.000
PRREINF	.099	.119	4.694	.000
PARREINF	-.091	-.086	-4.344	.000
PARATT	-.069	-.067	-3.288	.001
PEERATT	-.007	-.006	-.359	.719
SCHLATT	.006	.006	.319	.750
BELIEFS	.013	.012	.653	.513
(CONSTANT)	1.06		5.718	.000

R^2 = .552

TABLE 13
USE OF ALCOHOL BY PEER ATTACHMENT

		PEERATT LOW	HIGH	
USEALC		0	1	
NEVER	0	525 51.0%	252 55.3%	777 52.3%
EVER	1	504 49.0%	204 44.7%	708 47.7%
	COLUMN TOTAL	1029 69.3%	456 30.7%	1485 100%

CHI-SQUARE	VALUE	DF	SIGNIFICANCE
PEARSON	2.28007	1	.13105
CONTINUITY CORRECTION	2.11316	1	.14604
LIKELIHOOD RATIO	2.28284	1	.13801
MANTEL-HAENSZEL	2.27853	1	.13118
MINIMUM EXPECTED FREQUENCY - 217.406			

TABLE 14
USE OF ALCOHOL BY PEER ATTACHMENT
CONTROLLING FOR # OF PEERS WHO USE ALCOHOL (VALUE=0 "NONE")

PEERATT

USEALC		LOW 0	HIGH 1	ROW TOTAL
NEVER	0	378 79.1%	180 87.0%	558 81.5%
EVER	1	100 20.9%	27 13.0%	127 18.5%
	COLUMN TOTAL	478 69.8%	207 30.2%	685 100%

CHI-SQUARE	VALUE	DF	SIGNIFICANCE
PEARSON	5.93437	1	.01485
CONTINUITY CORRECTION	5.42428	1	.01986
LIKELIHOOD RATIO	6.25603	1	.01238
MANTEL-HAENSZEL	5.92571	1	.01492

MINIMUM EXPECTED FREQUENCY - 38.378

TABLE 15
USE OF ALCOHOL BY PEER ATTACHMENT
CONTROLLING FOR # OF PEERS WHO USE ALCOHOL (VALUE=1 "A FEW")

		PEERATT		
		LOW	HIGH	
USEALC		0	1	ROW TOTAL
NEVER	0	123 38.6%	65 41.4%	188 39.5%
EVER	1	196 61.4%	92 58.6%	288 60.5%
	COLUMN TOTAL	319 67.0%	157 33.0%	476 100%

CHI-SQUARE	VALUE	DF	SIGNIFICANCE
PEARSON	.35595	1	.55076
CONTINUITY CORRECTION	.24691	1	.61926
LIKELIHOOD RATIO	.35468	1	.55147
MANTEL-HAENSZEL	.35520	1	.55118

MINIMUM EXPECTED FREQUENCY - 62.008

TABLE 16
USE OF ALCOHOL BY PEER ATTACHMENT
CONTROLLING FOR # OF PEERS WHO USE ALCOHOL (VALUE=2 "MOST")

		PEERATT		
		LOW	HIGH	
USEALC		0	1	ROW TOTAL
NEVER	0	24 10.5%	6 6.6%	30 9.4%
EVER	1	205 89.5%	85 93.4%	290 90.6%
	COLUMN TOTAL	229 71.6%	91 28.4%	320 100%

CHI-SQUARE	VALUE	DF	SIGNIFICANCE
PEARSON	1.15804	1	.28187
CONTINUITY CORRECTION	.74573	1	.38783
LIKELIHOOD RATIO	1.23396	1	.26664
MANTEL-HAENSZEL	1.15442	1	.28263

MINIMUM EXPECTED FREQUENCY - 8.531

TABLE 17
USE OF ALCOHOL BY # OF PEERS WHO USE ALCOHOL
CONTROLLING FOR PEER ATTACHMENT (VALUE=0 "LOW")

		PEERSUSE			
		NONE	A FEW	MOST	
USEALC		0	1	2	ROW TOTAL
NEVER	0	378 79.1%	123 38.6%	24 10.5%	525 51.2%
EVER	1	100 20.9%	196 61.4%	205 89.5%	501 48.8%
	COLUMN TOTAL	478 46.6%	319 31.1%	229 22.3%	

CHI-SQUARE	VALUE	DF	SIGNIFICANCE
PEARSON	321.06266	2	.00000
LIKELIHOOD RATIO	352.40466	2	.00000
MANTEL-HAENSZEL	317.49089	1	.00000

MINIMUM EXPECTED FREQUENCY - 111.822

TABLE 18
USE OF ALCOHOL BY # OF PEERS WHO USE ALCOHOL
CONTROLLING FOR LEVEL OF PEER ATTACHMENT (VALUE=1 "HIGH")

		PEERSUSE			
		NONE	A FEW	MOST	
USEALC		0	1	2	ROW TOTAL
NEVER	0	180 87.0%	65 41.4%	6 6.6%	251 55.2%
EVER	1	27 13.0%	92 58.6%	85 93.4%	204 44.8%
	COLUMN TOTAL	207 45.5%	157 34.5%	91 20.0%	455 100%

CHI-SQUARE	VALUE	DF	SIGNIFICANCE
PEARSON	183.41477	2	.00000
LIKELIHOOD RATIO	208.38803	2	.00000
MANTEL-HAENSZEL	181.88336	1	.00000

MINIMUM EXPECTED FREQUENCY - 40.800

TABLE 19
PEER ATTACHMENT BY # OF PEERS WHO USE ALCOHOL

		PEERSUSE			
		NONE	A FEW	MOST	
PEERATT		0	1	2	ROW TOTAL
LOW	0	478 69.8%	319 67.0%	229 71.6%	1026 69.3%
HIGH	1	207 30.2%	157 33.0%	91 28.4%	455 30.7%
	COLUMN TOTAL	685 46.3%	476 32.1%	320 21.6%	1481 100%

CHI-SQUARE	VALUE	DF	SIGNIFICANCE
PEARSON	2.00958	2	.36612
LIKELIHOOD RATIO	2.00661	2	.36666
MANTEL-HAENSZEL	.07657	1	.78200

MINIMUM EXPECTED FREQUENCY - 98.312

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